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# *Croton diasii* and *Croton trombetensis*, Two New Euphorbiaceae from Amazonian Brazil

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**ABSTRACT.** Two new species of *Croton* are described from Amazonian Brazil, *Croton diasii* and *C. trombetensis*. *Croton diasii* is superficially similar to *C. schiedeanus*, but differs in having leaves with sparse lepidote scales on the lower surface, the upper surface glabrous, a pair of glands at the base of the blade, lack of petals in the pistillate flowers, and stamens densely villous on the lower half of the filaments. *Croton trombetensis*, which lacks a close affinity to any other *Croton* from the Brazilian Amazon, is characterized by leaves with a dense indument of stellate trichomes on both sides, a cordate base, long acicular stipules, a robust terminal thyrses 40–46 cm long, staminate flowers in fasciculate cymes, and pistillate flowers mixed among the staminate ones.

**RESUMO.** Duas novas espécies da Amazônia Brasileira, *Croton diasii* e *C. trombetensis*, são descritas. *Croton diasii* é superficialmente semelhante a *C. schiedeanus*, mas separa-se por apresentar folhas com tricomas lepidotos esparsos na face abaxial, a face adaxial glabra, um par de glândulas na base do limbo, ausência de pétalas na flor pistilada e estames densamente vilosos até a metade do filete. *Croton trombetensis* não apresenta afinidades claras com nenhuma outra espécie da Amazônia Brasileira, e caracteriza-se pelas folhas com denso indumento de tricomas estrelados em ambas as faces, base cordada, longas estípulas aciculadas, inflorescência em tirso terminal, robusta (40–46 cm de comprimento), as flores estaminadas em fascículos e as pistiladas misturadas com as estaminadas.

**Key words:** Amazon, Brazil, *Croton*, Euphorbiaceae.

*Croton* L. is one of the largest genera of flowering plants, with upward of 1200 species, most of these

distributed in the Antilles and South America (Webster, 1994; Govaerts et al., 2000). Since the treatment by Mueller (1873) in *Flora Brasiliensis*, the Brazilian species have not been revised taxonomically. Floristic and taxonomic works on *Croton* in South America, such as those of Lanjouw (1931), Croizat (1940, 1941, 1944), Jablonski (1965), Secco (1992), and Webster et al. (1999), neglected to examine a large number of specimens in Amazonian herbaria such as IAN, INPA, and MG. Consequently, the current state of understanding of Amazonian taxa of *Croton* is rather incomplete. In an attempt to revise the 40 or so species known from the Brazilian Amazon (including the states of Pará, Amapá, Amazonas, and Maranhão), we were able to recognize two additional species that are described below.

***Croton diasii*** Pires ex R. Secco & P. E. Berry, sp. nov. TYPE: Brazil. Pará: Belém, Reserva Aurá, 15 Jan. 1968 (fl), J. M. Pires & N. T. Silva 11377 (holotype, IAN). Figure 1.

Arbor monoecia trichomatibus lepidotis obtecta. Folia penninervia basi glandulis binis munita, subtus trichomatibus lepidotis obtecta, supra glabra. Inflorescentia in racemis unisexualibus vel bisexualibus. Flores staminati petalis anguste lanceolatis instructi; stamina usque ad dimidiam partem filamenti dense villosa. Flores pistillati sine petalis. Fructus junior castaneo-flavescens.

Tree 3–13 m tall. Leaves chartaceous or sometimes coriaceous, 7–19 × 2.5–7 cm, pinnately veined, elliptic to elliptic-oblong, the upper surface glabrous, the lower surface with readily visible lepidote trichomes, the base of the blade with a pair of glands, the apex acuminate, the base obtuse to slightly cuneate; petiole 0.5–1.5 cm long, with a ferruginous indument of scaly trichomes. Staminate

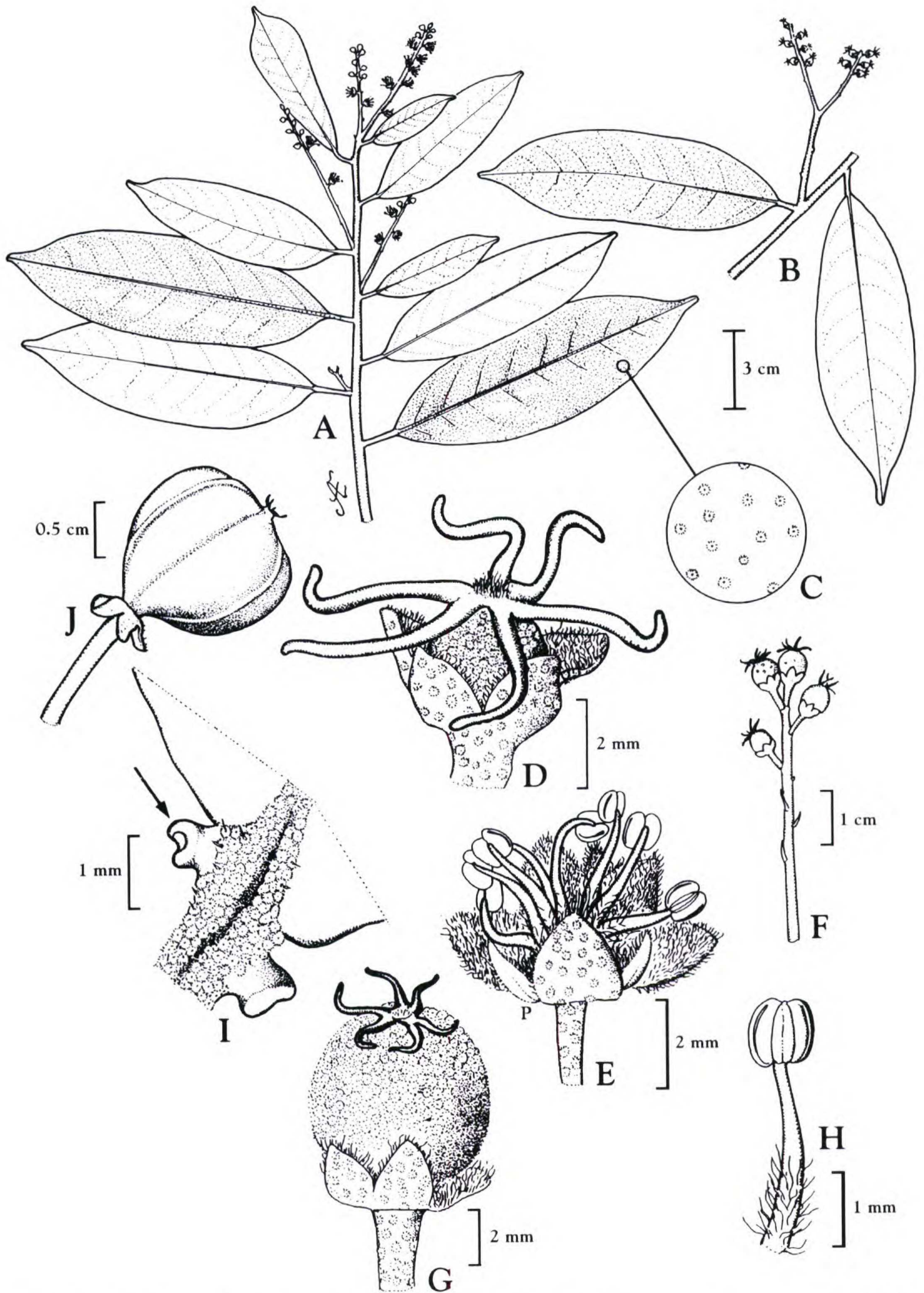


Figure 1. *Croton diasii* Pires ex R. Secco & P. E. Berry. —A. Branch with staminate inflorescences (Pires & Silva 11162). —B. Branch with pistillate inflorescence (Pires & Silva 11377). —C. Lepidote trichomes, from the abaxial side of the leaf (Pires 14905). —D. Pistillate flower (Pires & Silva 11377). —E. Staminate flower (p = petal, Pires & Silva 11162). —F, G. Young fruits (Schubert 2174). —H. Stamen with villous base of the filaments (Pires & Silva 11162). —I. Glands on the base of the leaf blade (Fróes 26596). —J. Mature fruit (Pires 14905).

inflorescence racemose, axillary and terminal, 3–8 cm long, the flowers single or in pairs; staminate flowers with pedicels 3–4 mm long, with lepidote trichomes, calyx 5-lobed, each lobe 2–2.5 × 1–1.5 mm, elliptic-lanceolate, with lepidote trichomes externally, villous trichomes internally; petals 4 or 5, narrowly lanceolate, 2–3 × 0.5–1 mm, glabrous externally, internally with villous trichomes and along the margins; stamens 12, filaments basally connate, 3–3.5 mm long, with villous trichomes concentrated near the base. Pistillate inflorescence an axillary or terminal raceme 4–6 cm long, occasionally geminate, the flowers single; pistillate flowers with pedicels 1–1.5 mm long, with lepidote trichomes, calyx 5-lobed, each lobe ca. 3 × 2 mm, elliptic-ovate, with lepidote trichomes externally, densely villous internally, petals lacking; ovary globose, 2–2.5 mm diam., 3-locular, with lepidote trichomes, styles 3, each branch bifid, with a tuft of trichomes at the base. Inflorescences rarely bisexual, then with staminate flowers more numerous and a few pistillate flowers near the base. Fruit subglobose, yellowish brown when young, 1.2–1.4 cm diam., with lepidote trichomes, the calyx persistent, mericarps 3. Seeds not seen.

*Croton diasii* superficially resembles *C. schiedeanus* Schlectendahl, but it can be distinguished by the following characters: leaves with scattered and readily visible lepidote trichomes on the lower leaf surface, the upper surface glabrous; a pair of glands at the base of the leaf blade; staminate flowers narrowly lanceolate; stamens densely villous in the lower half of the filament; lack of petals in the pistillate flowers; and young fruit yellowish brown. The geographic distribution of *Croton diasii* is restricted to the Brazilian state of Pará, whereas *C. schiedeanus* is much more broadly distributed, occurring in Mexico and Central America, Colombia, Venezuela, the Guianas, Ecuador, Peru, and recently recorded from Pará in Brazil.

Based on the presence of lepidote trichomes, entire and pinnately veined leaves with a pair of basal glands, stamens 12, pedicellate pistillate flowers, entire and eglandular sepals, and bifid styles, *Croton diasii* belongs to section *Argyrocroton* (Mueller Argoviensis) G. L. Webster, following the system proposed by Webster (1993).

The specific epithet honors Domiciano Dias, a renowned Brazilian entomologist and friend of Murça Pires.

*Paratypes.* BRAZIL. **Pará:** Belém, IPEAN, Reserva APEG, 28 ago. 1967 (fl), *J. M. Pires & N. T. Silva 11162* (IAN); Fazenda Aurá, mata terra firme, 30 set. 1950 (fl), *R. L. Fróes 26596* (IAN); rio Guamá, APEG, dez. 1965

(fl, fr), *B. G. Schubert 2174* (IAN); IPEAN, várzea do Aurá, 18 out. 1974 (fr), *J. M. Pires 14905* (IAN); Belém, terra firme, 13 jan. 1953 (fl, fr), *J. M. Pires & N. T. Silva 4438* (IAN).

***Croton trombetensis*** R. Secco, P. E. Berry & N. A. Rosa, sp. nov. TYPE: Brazil. Pará: município de Porto Trombetas, 1 Jan. 1998 (fl, fr), *R. P. Salomão & N. A. Rosa 880* (holotype, MG; isotypes, IAN, INPA, NY). Figure 2.

Arbor monoecia trichomatibus stellatis oblecta. Folia palmatinervia basi cordata, 2–3 glandulis laminae basi affixis, stipulae longae, aciculatae, subtus glandulis stipitatis instructa. Inflorescentia in racemis terminalibus robustis disposita; flores in fasciculis dispositi, pistillati cum pluribus floribus staminatis mixti. Flores staminati staminibus glabris in caespitibus trichomatum villosorum affixis. Flores pistillati petalis valde angustis inter se disiunctis. Fructus pulverulentus indumento dense stellato oblectus.

Tree to 15 m tall and 60 cm diam. (DBH). Leaves chartaceous, rarely subcoriaceous, 14–30 × 10–16 cm, palmately nerved, with a dense indument of stellate trichomes on both sides, the upper surface velutinous to the touch, the lower surface asperous, 2 or 3 glands at the base of the blade and stipitate glands sparsely distributed over the lower surface, margins dentate and glandular-stipitate in the sinuses, the apex caudate, the base cordate; petioles 10–24 cm long, with a dense indument of long, stellate trichomes; stipules acicular, 1–1.3 cm long. Inflorescence a terminal, racemoid thyrses 40–60 cm long, the rachis with densely stellate indument, the flowers grouped in fasciculate cymes, the staminate ones more numerous and grouped with the pistillate ones. Staminate flowers with a slender pedicel 0.8–1.0 cm long, with stellate trichomes, the calyx 5-lobed, each lobe 2.5–3 mm wide, ovate-elliptic, with stellate trichomes externally, glabrous internally, villous along the margins; petals 5, narrowly lanceolate, 3 mm long, 1 mm wide, glabrous externally, villous internally, stamens 16, the filaments glabrous, 5–6 mm long, emerging from a tuft of villous trichomes. Pistillate flowers with a thick pedicel 3–4 mm long, the calyx 5-lobed, each lobe 1.5–2 mm long, ovate, with a dense indument of stellate trichomes externally, internally with sparse stellate and simple trichomes, petals 5 or 6, narrow, well separated from each other, 1.5–2 mm long, glabrous externally, with villous trichomes internally and along the margins; ovary subglobose, 4 mm diam., with a dense indument of stellate trichomes, a segmented nectary disk at the base, styles 3, bifid, branches 7–8 mm long, sparsely stellate. Fruit with dense-stellate indument, ca. 1

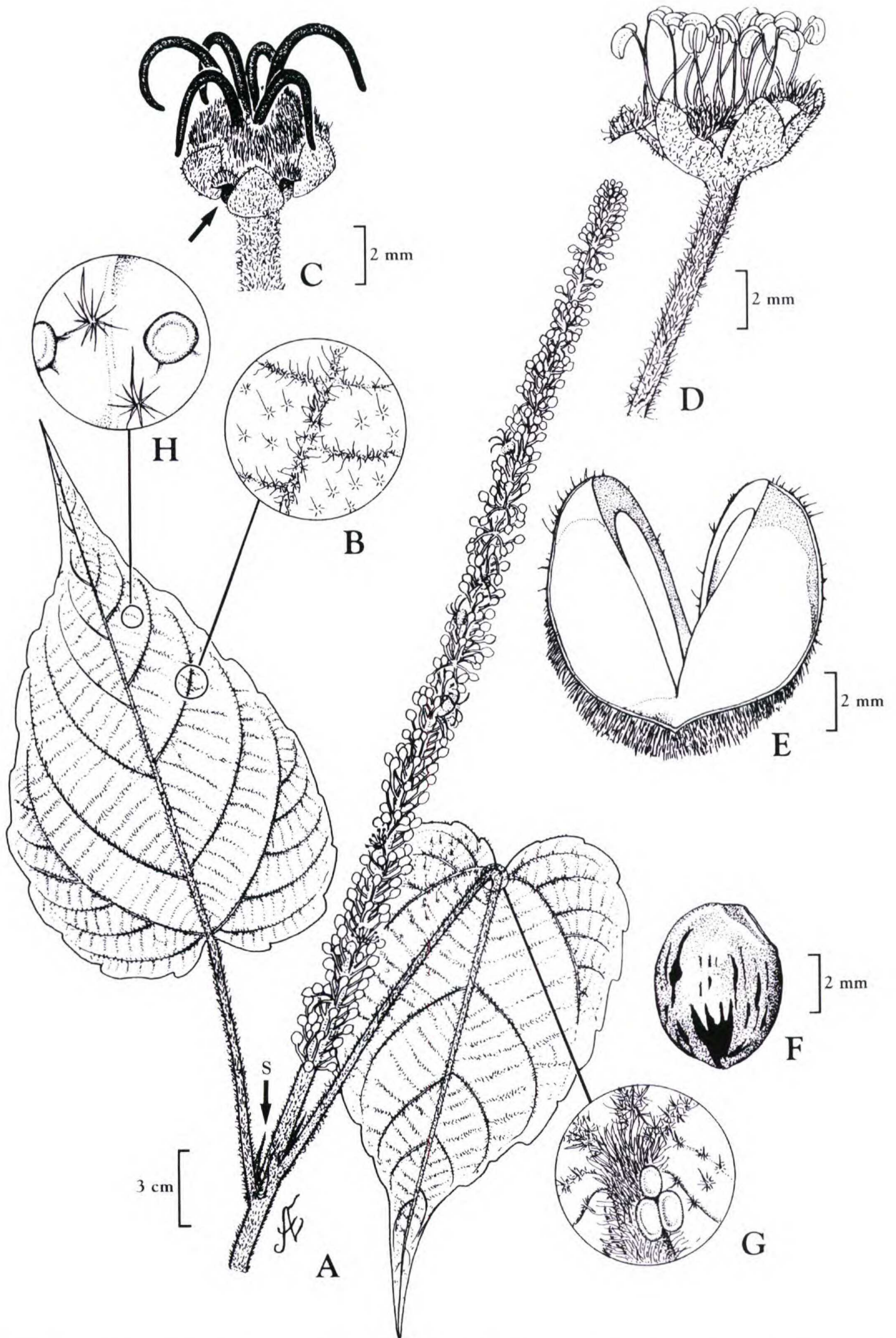


Figure 2. *Croton trombetensis* R. Secco, P. E. Berry & N. A. Rosa. —A. Branch with bisexual inflorescence (s = stipule). —B. Stellate trichomes from the lower surface of the leaf. —C. Pistillate flower (arrow points to one of the petals). —D. Staminate flower. —E. Mericarp opening in two parts. —F. Seed, showing poorly developed caruncle near the micropyle. —G. Glands at the base of the leaf blade. —H. Stipitate glands on the lower leaf surface. (All from Salomão & Rosa 880.)

cm diam., mericarps 3, seeds mottled, 6–7 mm long, barely carunculate.

According to the sectional delimitations of *Croton* proposed by Webster (1993), *C. trombetensis* belongs to section *Cyclostigma* Grisebach subsection *Cyclostigma*, based on the presence of palmately veined leaves with dentate margins, a dense indument of stellate trichomes, glands at the base of the leaf blade, terminal inflorescences with bisexual basal cymes, staminate flowers with 16 stamens, and pistillate flowers with petals and bifid styles. The species is further characterized by its arborescent habit, basally cordate leaves, long acicular stipules, stipitate glands on the lower leaf surface and the base of the blade, and very long racemes. The local common name of this species in Pará is “pau-de-índio,” and it appears to lack close morphological similarities to any other species of *Croton* from Amazonian Brazil.

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#### Literature Cited

- Croizat, L. 1940. Thirty-five new species of American *Croton*. *J. Arnold Arbor.* 21: 76–107.
- . 1941. Preliminaries for the study of Argentine and Uruguayan species of *Croton*. *Darwiniana* 5: 417–462.
- . 1944. Additions to the genus *Croton* L. in South America. *Darwiniana* 6: 442–468.
- Govaerts, R., D. G. Frodin & A. Radcliffe-Smith. 2000. World Checklist of Euphorbiaceae (and Pandaceae). Vol. 2. Euphorbiaceae: *Croton* to *Excoecariopsis*. Royal Botanic Gardens, Kew.
- Jablonski, E. 1965. Euphorbiaceae. In: B. Maguire & Collaborators, Botany of the Guayana Highland, Part VI, Mem. New York Bot. Gard. 12(3): 150–178.
- Lanjouw, J. 1931. The Euphorbiaceae of Surinam. J. H. de Bussy, Amsterdam.
- Mueller, J. 1873. Euphorbiaceae: *Croton*. In: C. F. P. Martius & A. G. Eichler (editors), *Flora Brasiliensis* 11(2): 82–273.
- Secco, R. S. 1992. Notas sobre as lianas do gênero *Croton* L. (Euphorbiaceae). *Bol. Mus. Para. Emilio Goeldi, sér. Bot.* 8(2): 265–281.
- Webster, G. L. 1993. A provisional synopsis of the sections of the genus *Croton* (Euphorbiaceae). *Taxon* 42: 793–823.
- . 1994. Synopsis of the genera and suprageneric taxa of Euphorbiaceae. *Ann. Missouri Bot. Gard.* 81: 33–144.
- , P. E. Berry, W. S. Ambruster, H.-J. Esser, L. J. Gillespie, W. J. Hayden, G. A. Levin, R. S. Secco & S. V. Heald. 1999. Euphorbiaceae. In: P. E. Berry, K. Yatskievych & B. K. Holst (editors), *Flora of the Venezuelan Guayana* 5: 72–228. Missouri Botanical Garden Press, St. Louis.